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SECRETARY OF STATE

NEBRASKA ADMINISTRATIVE CODE

TITLE 228 - DEPARTMENT OF LABOR

CHAPTER 43 - MAINTENANCE

001. This chapter is adopted pursuant to Neb. Rev. Stat. §48-1803.

002. All equipment relative to amusement rides and devices shall be given periodic maintenance service. This shall include properly lubricating and cleaning machinery, engines, and motors. Worn mechanical parts, padding material, bungee jump harnesses, bungee cords, and cushioning shall be replaced and kept in a safe condition and machinery shall be periodically inspected for loose fasteners. Lockout devices shall be engaged prior to inspecting or servicing a piece of equipment. The upholstery shall be examined and no loose or flapping portions of upholstery or decoration shall be permitted. Equipment and structure for amusement rides and amusement devices shall be kept free from protruding nails, loose nails, splintered wood, loose and wobbly seats, and rough, loose, or dangerous arm rests.

003. Wire rope shall be thoroughly examined. Wire rope found to be damaged shall be taken out of service and replaced with new rope of proper design and capacity. Any of the following conditions shall be cause for rope replacement:

A. In running ropes, six randomly distributed broken wires in one rope lay, or three broken wires in one strand in one rope lay. A rope lay is the length along the top in which one strand makes a complete revolution around the rope.

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B. In pendants or standing ropes (ropes bearing the entire load and subjected to constant pressure and surge shocks), evidence of more than one broken wire in one rope lay.

C. Abrasion, scrubbing, or peening causing loss of more than 1/3 of the original diameter of the outside wires.

D. Severe corrosion.

E. Severe kinking, severe crushing, or other damage resulting in distortion of the rope structure.

F. Heat damage resulting from a torch or arc caused by contact with electrical wires.

G. Reduction from normal diameter of more than 3/64 inch for diameters up to and including 3/4 inch; 1/16 inch for diameters 7/88 inch to 1 1/8 inches; 3/32 inch for diameters 1 1/4 inches to 1 1/2 inches. Marked reduction in diameter indicates deterioration of the core resulting in lack of proper support of the load carrying strands.

H. Bird caging or other distortion resulting in some members of the rope structure carrying more load than others.

I. Noticeable rusting or development of broken wires in the vicinity of attachments. If this condition is localized in an operating rope, the section in question can be eliminated by making a new attachment. This may be done rather than replacing the entire rope.

J. Wire ropes used to support, suspend, bear, or control forces and weights involved in the movement and utilization of tubs, cars, chairs, seats, gondolas, other carriers, the sweeps, and other supporting members of a ride or device shall not be lengthened or repaired by splicing.

K. Couplings, sockets, and fittings shall be of an approved design and type and installed in accordance with the instructions or specifications of the designer, engineer, or manufacturer.

L. Bungee cords shall not be used for jumps in excess of the manufacturers suggested maximum number of jumps for the particular bungee cord.

004. Footings, splices, uprights, track timbers, ledgers, sills, laps, bracing, flooring, and all other wood components of rides, devices, and structures shall be inspected for deterioration, cracks, or fractures. Emphasis shall be given to ensuring tight nails, bolts, lag bolts, and other fasteners. A minimum of eighteen inches of soil, with respect to grade, shall be removed around piling or wood members embedded in dirt for support to check deterioration. When wood piling requires replacement, ground level concrete piers shall be used. Wood members found to be defective shall be replaced with material of equal or greater strength and capacity. Repairs and replacements to fixed roller coasters shall be made in accordance with the recommendations of the manufacturer.

005. An adequate number of containers for refuse shall be provided in and around all amusement rides and devices, permanent structures, and temporary structures. Excessive accumulations of trash and refuse shall be promptly removed. All parts of amusement rides and devices, temporary structures, and permanent structures used by the public shall be maintained in a clean condition. All walkways between amusement rides and devices shall be kept free from debris, obstructions, and other hazards.

006. All open-type electric motors exposed to water shall be given a dielectric test at least annually to ensure a safe operation and the results are to be kept with the carnival or in the amusement park office. This test is not necessary if a motor is not exposed to water.

007. The mechanical devices that brake, control, or come in contact with wire rope (such as rollers, drums, and sheaves) shall be examined on a periodic basis to ensure cleanliness and safe condition. Mechanical devices with broken chips, undue roughness, or uneven wear shall be replaced immediately.

008. The articulating pinions, frames, sweeps, eccentrics, and other mechanical members shall be inspected for wear, out of round, cracks, and other signs of deterioration and shall be kept in good repair. Bearing surfaces, ball joints, and other single or multiple direction mechanical surfaces shall be kept well lubricated, clean, and inspected for out of round or out of spherical and shall be kept in good repair. Gear alignment and gear drives shall be kept in good repair.

009. Motor wiring, general service circuitry, decorative wiring, festoon wiring, and concession stand wiring shall be inspected for insulation wear, fraying, or other signs of deterioration such as cracking. Secure tape repairs may be used, however, use of tape repairs shall be kept to a minimum. Wire clips on articulating devices shall be kept in good repair and wires at elbows and at the end of articulating devices shall be emphasized during inspections.

010. Retaining, restraining, and containing devices shall be inspected to ensure they can continuously fulfill their function. Worn and damaged areas shall be repaired immediately or shall be cause for immediate replacement.

011. The system is to be checked for leaks, damaged pipe, and worn or deteriorated hoses.

012. Pressure relief valves or devices shall be exercised on a periodic basis to ensure that they operate properly. This includes compressed air and gas devices.

013. Electrical conductors and electrical equipment installed and utilized on or around permanent and temporary amusement parks and amusement rides shall conform to the minimum standards of the current National Electrical Code. The following rules are stated for emphasis and clarification and are supplemental to the National Code. If any conflict exists or appears to exist, the National Code shall have precedence.

A. Installation.

Portable electrical systems required by temporary amusement rides or devices and temporary structures shall be installed by a qualified electrician.

B. Grounding.

Rides shall not operate until all grounding electrode conductors, equipment, and safety grounding connections are secured, polarized, and tested. The grounding conductors shall conform to the current National Electrical Code. The path to ground from circuits, equipment, and conductor enclosures shall be permanent and continuous and shall have ample carrying capacity to conduct currents liable to be imposed on it and shall have impedance sufficiently low to limit the potential above ground and to facilitate the operation of the overcurrent devices in the circuit.

C. Service ground.

Equipment or generators operating from a separate supply or supplies which are located closer than eight feet and all service equipment within itself shall be bonded together. The service ground shall be established by connecting the grounding conductor to the service entrance neutral bar in the hot truck or generator and to an approved type service grounding electrode such as ground rods. If 25 ohms or less is not obtained by a single grounding electrode such as a ground rod plate or pipe, it shall be augmented by one additional grounding electrode of the type permitted by code.

D. Circuit and equipment safety.

From the service entrance neutral bar, the circuit grounded and equipment safety grounding conductors shall be continuous and separate throughout the entire system. The portable outlet and terminal boxes shall contain a service ground through grounded receptacles for both circuit and safety. The equipment safety grounding conductors shall be attached to each ride, device, or concession booth such that impedance is sufficiently low to limit the potential above ground and to facilitate the operation of the overcurrent devices in the circuit. Separate steel tracks or steel framework (such as roller coaster tracks or big slides) shall have grounding the same as the service equipment.

E. Current limiting devices.

Conductors shall be fused or protected to their current carrying capacities. No more than six disconnect switches are to be in the hot truck or generator unless a main switch is provided. All distribution lines from hot trucks or generators shall be adequate to supply the load being served. No fuses or current limiting devices shall be installed in the neutral or grounding conductors. Motors and lighting circuits shall be fused separately.

F. Bus bars.

Bus bars shall be located low or near the bottom of the cabinet. Separate bus bars shall be provided for grounding neutral and phase conductors. Color codes painted on inside and outside of box but not on contact surfaces of bus bars are to be:

GROUND -	green or green with yellow strip	1st Phase -	BLACK
		2nd Phase -	RED
NEUTRAL -	white, natural, or gray	3rd Phase -	BLUE

On a four-wire delta-connected secondary, the phase conductor having the higher voltage to ground shall be orange.

These color codes are to carry on through all connected wiring from service through portable power outlet and terminal boxes. Buses shall not be less than 200 ampere capacity. The load terminals in a switchboard or panel board shall be located so that it will be unnecessary to reach across or beyond a live bus (hot bus) to make a local connection.

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